

CLAIMS

1. A method for facilitating the identification, authentication or quality control of packaged products, which methodology comprises:
  - 5 in a first marking phase:
    - obtaining data representative of an analytical specification of a chemical composition for the product;
    - processing and recording the data on a machine readable data storage means provided in direct mechanical association with the packaged product;
  - 10 and in a second authentication phase:
    - applying a suitable data reader to the data storage means to read the recorded data and reconstruct the recorded analytical specification;
    - chemically analysing a sample of the product to obtain data representative of an analytical specification of the actual chemical composition for the product;
  - 15 comparing the results of the said analysis with the recorded readings within predetermined tolerance limits.
- 20 2. A method in accordance with claim 1 wherein the data storage means is incorporated into or onto or as a part of the packaging.
3. A method in accordance with claim 1 or claim 2 wherein the analytical specification comprises a two-dimensional range map of variable 25 intensity information referenced against a test parameter across a range of values.

4. A method in accordance with claim 3 wherein the analytical specification comprises an analytical spectrum of variable intensity information referenced across a frequency range.
  5. A method in accordance with claim 4 wherein the authentication phase of the methodology is modified to comprise the step of repeating the chemical analysis of the above marking phase to obtain data representative of an analytical specification of the actual chemical composition for the product.
- 10
6. A method in accordance with any preceding claim wherein an analytical specification is generated by an analysis method comprising a method of obtaining a spectrum representative of the chemical composition of the product, wherein intensity data varies across a range of frequencies.
  - 15
  7. A method in accordance with claim 6 wherein an analytical spectrum is generated by nuclear magnetic resonance.
- 20
8. A method in accordance with any preceding claim wherein the same analysis method is used to generate a reference analytical specification to create reference data during the marking phase and to generate a measured analytical specification during the authentication phase.
- 25
9. A method in accordance with any preceding claim wherein the analytical spectrum is obtained by batch analysis of the product to be packaged, for example during manufacture or otherwise prior to or during packaging.

10. A method in accordance with any preceding claim wherein reference data is recorded further including additional compositional data derived from standards, reference specifications, predetermined tolerance parameters and the like.

5

11. A method in accordance with claim 9 or claim 10 wherein the analytical spectrum is obtained by testing of a representative sample for each product or batch of products at the time of packaging, the marking phase of the methodology thus comprising the step of analysing a

10 sample of the product, prior to or during packaging, to obtain data representative of at least of an analytical specification of the sampled composition, and thus indicative of a predetermined desired chemical composition for the batch of product, and the step of processing and recording the data on a machine readable data storage means provided in direct mechanical association with each product or unit of the batch 15 of packaged product.

12. A method in accordance with any preceding claim wherein the data storage means comprise optically, electronically and magnetically readable devices and/or areas on or comprised as part of the packaging.

20  
25 13. A method in accordance with claim 12 wherein the data is stored on data storage means comprising optically readable areas having a graduated scale such that data is stored by the position and also by the intensity, shade, tone, colour, hue or the like of an optically readable mark.

14. A method in accordance with claim 13 wherein the analytical specification comprises intensity data mapped across a measured

analytical range, and is recorded such that position on the marking corresponds to the range, and in that the shading, tone, colour, hue or the like corresponds to intensity.

- 5    15. A method in accordance with claim 13 or claim 14 wherein the data storage means comprises an optically readable grey-scale marking.
- 10    16. A marking method to facilitate the identification authentication or quality control of packaged products, comprising the marking phase in accordance with any preceding claim performed independently.
- 15    17. An authentication method for the identification, authentication or quality control of packaged products marked in accordance with claim 16 comprising the authentication phase in accordance with one of claims 1 to 15 performed independently.
- 20    18. A system for the identification, authentication and quality control of packaged products comprising:  
a marking system comprising:  
a machine readable data storage means provided in direct mechanical association with the packaged product, in particular being incorporated into or onto or as a part of such packaging; and  
a marking device for processing data representative of an analytical specification of a chemical composition for the product and recording the data on the data storage means in readable form;
- 25    an authentication system comprising:  
an authentication device comprising a suitable data reader to read the recorded data on the data storage means and reconstruct the analytical specification; and

- a chemical analyser to perform a subsequent analysis of a sample of the product to obtain data representative of aspects of the actual chemical composition for the product; and  
5 a means to compare the results of the said analysis with the recorded specification within predetermined tolerance limits.
- 10 19. A system in accordance with claim 18 wherein the marking system is provided in association with a chemical analyser adapted to carry out an identical analysis to that carried out by the authentication system, to analyse a sample of the product to obtain the said analytical specification prior to or during packaging, and data processing means to collect and process the data and convert to a reference mark for application by the marking system.
- 15 20. A system in accordance with claim 18 or 19 wherein the authentication system includes display means to display a result to a user.
- 20 21. A marked packaged product to facilitate identification, authentication and quality control of the contents thereof comprises a product retained within a container and having in direct physical association with the container and for example on or comprising a part thereof, a machine readable reference mark incorporating prerecorded data comprising a reconstructable analytical specification indicative of the expected chemical composition of the product.
- 25 22. A method, system or product substantially as hereinbefore described with reference to the accompanying drawings.